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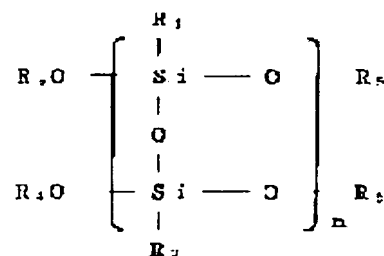
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54) PHOTSENSITIVE SILICONE LADDER POLYMER COMPOSITION AND METHOD FOR TRANSFERRING PATTERN TO THIS COMPOSITION AND SEMICONDUCTOR DEVICE USING THIS COMPOSITION

57)Abstract:

PROBLEM TO BE SOLVED: To enable microfabrication by direct light by incorporating the specified silicone ladder polymer and a photosensitive cross-linking agent or a photopolymerization initiator.

SOLUTION: The photosensitive silicone ladder polymer composition comprises the cross-linking agent or a photopolymerization initiator, and the silicone ladder polymer represented by the formula in which each of R1 and R2 is, independently, an H atom or an aryl or alkyl or functional group having an unsaturated bond; each of R3-R6 is, independently, an H atom or an aryl or alkyl or trialkylsilyl or functional group having an unsaturated bond; some of R1-R6 is an amount of >= 1 weight% of them is a photosensitive functional group; and (n) is a natural number. This photosensitive silicone ladder polymer composition comprises this ladder polymer and the photosensitive cross-linking agent or the photopolymerization initiator, and therefore, it is insolubilized in solvents and made possible to be microfabricated by direct light.



LEGAL STATUS

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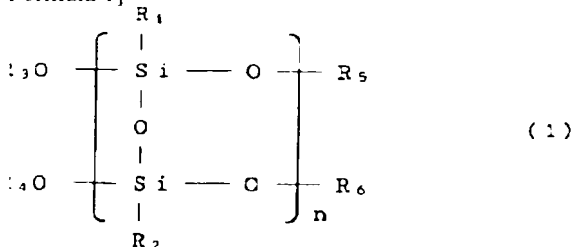
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CLAIMS

Claim(s)]

Claim 1] The following general formula (1)

Formula 1)



Among a formula, R1 and R2 may be a functional group which has an aryl group, a hydrogen atom, an aliphatic alkyl group, or a unsaturated bond, and even if they are of the same kind, different species are sufficient as them.) R3, R4, R5, and R6 may be a functional group which has a hydrogen atom, an aryl group, an aliphatic alkyl group, a trialkylsilyl group, or a unsaturated bond, and different species are sufficient as them even if they are of the same kind. However, it is the functional group which has photosensitivity one of R1, R2, R3, R4, R5, and R6% of the weight or more, and n is a natural number. Photosensitive silicone ladder system resin constituent containing the silicone ladder system resin and the photosensitive cross linking agent which are expressed, or the photopolymerization initiator.

Claim 2] The photosensitive silicone ladder system resin constituent according to claim 1 with which the functional group which has a unsaturated bond is characterized by being an ARUKENIRU machine, an alkyl acryloyl machine, an alkyl methacryloyl machine, or a styryl machine.

Claim 3] The photosensitive silicone ladder system resin constituent according to claim 1 or 2 characterized by containing a photosensitive cross linking agent or a photopolymerization initiator 0.01 to 20% of the weight to a silicone ladder system resin.

Claim 4] The photosensitive silicone ladder system resin constituent according to claim 1 to 3 characterized by containing a photosensitizer or an optical start assistant.

Claim 5] The photosensitive silicone ladder system resin constituent according to claim 4 characterized by containing a photosensitizer or an optical start assistant 0.01 to 10% of the weight to a silicone ladder system resin.

Claim 6] The photosensitive silicone ladder system resin constituent according to claim 1 to 5 characterized by containing a polymerization inhibitor.

Claim 7] The photosensitive silicone ladder system resin constituent according to claim 6 characterized by containing a polymerization inhibitor 10 ppm - 5% of the weight to a silicone ladder system resin.

Claim 8] The photosensitive silicone ladder system resin constituent according to claim 1 to 7 characterized by containing a silane coupling agent.

Claim 9] The photosensitive silicone ladder system resin constituent according to claim 8 characterized by containing a silane coupling agent 10 ppm - 10% of the weight to a silicone ladder system resin.

Claim 10] The photosensitive silicone ladder system resin constituent according to claim 1 to 9 characterized by containing a photopolymerization nature monomer or photopolymerization nature oligomer.

Claim 11] The photosensitive silicone ladder system resin constituent according to claim 10 characterized by containing a photopolymerization nature monomer or photopolymerization nature oligomer 10 ppm - 100% of the weight to a silicone ladder system resin.

Claim 12] The pattern imprint method of giving the process which develops the process which carries out stoving at 5-degree-C or more low temperature from the decomposition temperature of the process which forms the resin constituent film which contained the photosensitive silicone ladder system resin constituent according to claim 1 to 11 in the substrate, a photosensitive cross linking agent, a photopolymerization initiator, a photosensitizer, an optical start assistant, a polymerization inhibitor, a silane coupling agent, a photopolymerization nature monomer, or photopolymerization nature oligomer, the process exposed using a photo mask, and the above-mentioned resin constituent film.

Claim 13] The pattern imprint method according to claim 12 characterized by using the substrate by which silane coupling processing was carried out.

Claim 14] The pattern imprint method according to claim 12 or 13 characterized by exposing in an inert atmosphere.

Claim 15] The pattern imprint method according to claim 12 to 14 characterized by giving the process heated at 5-degree-C or more low temperature after exposure from the decomposition temperature of a photosensitive cross linking agent, a photopolymerization initiator, a photosensitizer, an optical start assistant, a polymerization inhibitor, a silane coupling agent, a photopolymerization nature monomer, or photopolymerization nature oligomer.

Claim 16] It is the pattern imprint method according to claim 12 to 15 characterized by performing development by giving etching and a rinse to a resin constituent film alternately with multiple times.

Claim 17] The semiconductor device equipped with the semiconductor substrate and the resin constituent film which consists of a photosensitive silicone ladder system resin constituent according to claim 1 to 11 prepared in this semiconductor substrate.

Claim 18] The semiconductor device according to claim 17 which a resin constituent film is an insulator layer and is characterized by *****, the

Translation done.]